

## Comments for the HIT Standards Committee Implementation Workgroup

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### **Summary**

The Oregon Region of Providence Health and Services is bringing to its patients and providers a new level of standards-based interoperability. Drawing from its long experience with healthcare IT and its limited success with view-only integration, Providence has moved to a strategy based around Health Information Exchange technology (specifically, an IHE XDS.b registry and repository). Our solution integrates key pieces of clinical data using HITSP CCD document interchange combined with advanced user interface modifications that limit the impact on providers. By building this technology into our core EMR functionality, we sidestep adoption questions, quickly bring significant value to the bedside, and open the route to broad and ubiquitous exchange of critically needed electronic medical record information.

### **About Providence**

Providence Health and Services has been providing health care on the West coast of the United States for the past 150 years. Our Oregon Region includes eight acute care facilities, dozens of clinics and ambulatory practices, a home health service, and a comprehensive health plan. Providence Oregon is also highly automated – we have more than twenty years of experience with clinical systems and electronic medical records. Our hospitals have uniformly adopted bedside clinical documentation and bar-coded medication administration. Our clinics have mandated use of a paperless EMR for more than ten years.

Providence engages a large and diverse community of physicians, including physicians employed by Providence, tightly affiliated independent practitioners, and providers who share their clinical practice among both Providence and non-Providence facilities. Portland, our primary urban service area, is a leader in EMR adoption. An estimated 60% of Portland-area physicians have some EMR capacity; more than 30% use or have available a fully-functional electronic record.

Those electronic systems come from a variety of vendors. Providence itself has a variety of clinical systems, including inpatient clinical systems from McKesson, a GE outpatient EMR, an Emergency Department EMR from Picis, and a home care documentation system from Allscripts. None of these were designed to share actionable data, and over the years this has produced a profound splintering of the record.

### **Our History of Data Integration**

We have a long history of trying to integrate the medical record between systems. We have built the usual collection of HL-7 interfaces, of course, sending transcription data and laboratory results between our various systems. We have implemented an Enterprise Master Person Index to help align patient

identity between the systems. We use a Physician Portal to provide visual integration between systems, aggregating reports and results as well as enabling selected custom additions such as a real-time remote view of bedside monitors for patients in certain locations.

Within the past few years, we implemented within our Portal what we call the “clinic tab”, which is a view for the inpatient physician of the patient’s most recent visit to our own primary care clinics. Employing a sophisticated custom-built background identity matching and data extraction system, this shows the physician a read-only view of the patient’s clinical data (allergies, medications, problems, immunizations, and clinic notes) for the most recent visit. We have a similar tab, very recently introduced, that enables a read-only view of the last Emergency Department visit.

In the pre-standards world, this is as much as any health system can do to integrate disparate systems, and far more than many smaller systems can achieve. But it is not enough. We have had major adoption struggles with the clinic tab. We know that it is used. We also know that it is most likely to be ignored when the situation is complicated, the patient is very ill, and the care is fragmented between multiple providers. We have mapped the workflows around its use and we know that it adds significant time to the admission process, because information must be manually extracted and re-entered in the inpatient systems. It also represents only one record of the dozens that may potentially hold information.

### **A New Course – The Connected Experience of Care**

In 2007, Providence Oregon underwent a strategic visioning that told us that our patients needed us to do a far better job of talking to each other. We asked thousands of patients for their input on issues from quality of care, which they expected, to continuity and follow-through, which our patients felt was something they broadly lacked from all health care institutions. From this we evolved our vision of “The Connected Experience of Care”, which broadly translates to the simple tasks of truly knowing our patients, caring for them well, and making the process as simple as possible.

Connected care is not an Information Technology feature. It is a behavior, or rather a series of behaviors, from every clinician and non-clinical staff member who interacts with a patient. It consists of demonstrating at each transition in care and with each clinical event that we know who we serve and that we intend to use that knowledge to provide the best experience possible. A major support to that behavior, however, must come from a connected electronic medical record.

Connected care does not require a unitary medical record. Providence examined that option in detail, and determined that moving to a single enterprise EMR would have significant benefits, albeit at a substantial cost. More significant, however, was the knowledge that Providence’s core business was dependent on records from far more entities than just Providence, and that we were never going to be able to convince every physician seeing our patients that they should dispense with their own EMR. So we looked instead to interoperability.

### **Standards-based Interoperability – The Connect Program**

This is a golden season for interoperability between electronic medical record systems. IHE, HITSP, and CCHIT have articulated standards that can form the basis for a complete end-to-end data integration approach. Providence took those standards and, in partnership with our IT vendors and others, defined the architecture that we now call our Connect Program.

The Connect Program is built on several crucial core principles. They include:

- **Actionable Data**

We recognize that we cannot integrate the entire world at once, and we have seen the limitations of data that a clinician can see but cannot integrate readily into their own record. For that reason, we have focused on integrating a select set of structured data into the standard work of the EMR. We rely on the ability of the structured documents in our HIE to carry this data in a way that can be reliably and safely translated between systems.

- **Vendor neutrality**

Providence owns systems from some of the largest and oldest IT vendors in the industry. Add in the vendors used by our partners in the region, and nearly every significant healthcare IT company is represented. We do not favor one over the other for interoperability, and we insist that unencumbered vendor-neutral standards be used for interchange.

- **Simplicity in use**

Clinicians are working far too hard as it stands today. We cannot add significant work to their day in the form of an incoherently shared record. We must also be alert to problems of scalability. What works passably well for a single shared record (like the clinic tab) becomes completely impossible when you have a patient seen in a dozen sites of care. For our sickest and most vulnerable patients, this scenario happens more frequently than is comfortable.

This is especially important when we are interoperating with physicians in small or less-advantaged practices. In the absence of a sophisticated IT and training team, physicians need something truly straightforward and supported as a standard.

- **Universal adoption**

We cannot ask clinicians to use interoperability. We need a system that automatically generates and consumes interoperability data, doing so in a way that integrates into the normal use of the EMR. In this way, we avoid the inevitable adoption fight and the seemingly-inevitable adoption drop-off for the sickest, most vulnerable, and most challenging cases.

- **General availability**

Providence has requested and our vendors have agreed that the functionality we are piloting be generally available as part of our vendors' core systems. CCHIT requirements (and now ARRA requirements) have helped make this business case, but the cold fact is that Providence does

not want yet another unsustainable customization to our base IT systems. We need this functionality to be an unremarkable part of our EMR.

Using these core principles, Providence and its vendors first built prototypes to evaluate user interfaces, user acceptance, and issues with taxonomy and document structure. This prototype system, first brought live in December 2008, has shown the limitations of the current standards as well as their opportunities, and has helped us to define the production behavior of the system.

Through the bulk of 2009 we have participated in the process of bringing this system live to our users. Our belief is that if we are going to achieve interoperability which can be used in every site of care, it must be as well integrated into the EMR as any other core feature. For this reason, we have worked with GE and McKesson to add these core features, to test them, and to plan their deployment. We are now in the final phases of validation testing .

On December 7, 2009, beginning with our facility in Seaside, Oregon, every clinic visit and every hospital stay will produce one or more interoperability documents, stored in our production HIE, and consumed automatically at appropriate moments in the clinical stay. Medication, allergy, and problem data is coded in vendor-neutral taxonomies, and the documents themselves are required to pass NIST validation to ensure their compliance to the standard. When consumed, the information contained in the documents (HITSP C32 CCD summaries of care) is merged automatically into the data resident in the EMR and marked as needing additional confirmation only if the imported information differs from that already known. In the case where there are conflicts in the data, the clinicians are shown the differences, allowed to ascertain their best view of the truth, and given simple ways to reconcile the data.

The user interfaces and EMR features have undergone extensive usability review, with an eye to adoption not just by Providence but by any customer. Providence has worked with certain of our core affiliated physician partners, because we are planning to extend this interoperability in 2010 not just to our own network of clinics but to any provider with a system that can produce and consume the necessary standardized documents. We are working actively with the vendors of other systems in our IT environment and expect to bring more clinical areas into the Connect program this year.

We are also not stopping with this limited core data. Our HIE is live, and we are already using it to implement changes in our lab and ancillary ordering workflow, and to store data (transcriptions, results, and other core clinical data) that can join the Connect-level integration in the future.

### **Lessons Learned**

Providence's multi-year journey in data sharing across organizational and system boundaries has taught us valuable lessons – lessons that we believe will make the difference between technology that is simply available and technology that is widely used. Among these are:

- Concentrate on the clinician. Focusing on IT is necessary during implementation, but it is at the bedside in the clinic, the hospital, or the home, that this technology will be used. Begin there, by understanding in detail how the data you propose to interoperate is actually used.
- Concentrate on the patient in their moments of greatest risk, and remember that in those moments of transition patients may be unconscious, demented, incoherent, or simply too young to participate in their own care. And that those times are when interoperable records may be the most critically valuable.
- There is no substitute for actionable data. Images and text may be helpful in many places. But in trying to make sense of the hash that will be immediately visible when multiple records are viewed, computer support is critical. Not everything needs to be coded and structured overnight, but the standards need to support a complete and safe machine-understandable view of the medical record.
- Taxonomies are hard; semantics differ between EMRs. The greatest challenges we have faced involve translations between vendor-specific and vendor-neutral formats. RxNorm is an excellent neutral medication taxonomy, but operational details have required extensive work. More, EMRs that were not designed for interoperability (which is nearly all of them) have made decisions in their own structured data that may or may not match the decisions made by standards committees. In our experience, this does not inhibit interoperability, but it has required careful (but not difficult) coding to avoid information loss.
- Don't expect to change workflows overnight; neither should you try to automate dysfunction. It is easier by far to make a minor change to a workflow combined with a major change "under the hood" than it is to do the opposite.
- What you **can** do is far less important than what you **will** do. Whenever possible, build interoperability so that it is easier to use than to avoid.
- Concentrate on high success with limited data rather than wide but shallow efforts. It is far easier to add data to a successful data stream than it is to convince clinicians who have chosen not to cooperate that it's time to try it again.
- Not all data is of the same value. A comprehensive view of allergies and medications is far more important to clinical questions at a rapid handover than is a snapshot of the family medical history. This is not to say that the latter is unimportant; rather that our efforts should not delay the former in pursuit of the latter.

### **Small Groups and Critical Access Providers**

Physicians in small groups and in less technical practices make up a core part of Providence's physician community. There are significant barriers to interoperability in this constituency. The most significant, of course, is that these physicians are the least likely to have an operating EMR. An HIE provides a variety

of ways of looking at patient data that requires only a Web browser; our Physician Portal is one such and, because of its intrinsic connection to the HIE, will enable that access.

In the context of “meaningful use”, however, we know that a larger segment of these physicians will be acquiring EMR technology from a variety of vendors. We built our solution using core HITSP standards because we knew that CCHIT required the ability to interoperate with this data. Our position is that so long as a certified EMR must at a minimum consume and produce standard interoperable data we can serve our smaller practices without restricting their choice of vendors. We believe, supported by our recent experience, that a structured record is no harder to produce than an unstructured view. And we know that the small provider is the one who has the least time to manually review, collate, and re-enter a complicated “view-only” record.

### **Conclusion and Final Thoughts**

There is a truism in clinical computing that asserts that “computers don’t create problems as much as they reveal them.” Providence’s decade-long effort in data interchange has made this point time and time again. We have been challenged by our own workflows, by the time-limited and relatively nontechnical environment in our providers’ offices, and by the maintenance “tail” inherent in custom self-designed solutions. We have learned and suffered from the limitations of read-only access to systems and clinical summaries that can be viewed but not effectively integrated.

All of this has justified the wisdom of EMR-resident standards-based solutions, and our greatest successes have come in the environment of 2009, as the industry has finally reached a critical initial plateau of standards-based data interchange. We expect in 2010 and beyond to leverage these successes. We will expand the number of interoperating systems and extend the benefits to our broader provider community, and re-engineer workflows and our clinical environment to take full advantage.